

A Guide to Classifying Organisms



Nov 25-6:09 PM

Table of Contents

- SECTION A: Defining Classification
- SECTION B: Domains of Life
- SECTION C: Dichotomous Key

Click on any red underlined text to jump to that section or use the forwards and back arrows found at the bottom of the pages.



Nov 25-6:11 PM

SECTION A: Defining Classification

- Defining Classification
- Classification in Biology
- Carolus Linnaeus
- 7 Taxa
- Binomial Nomenclature



Nov 28-8:23 PM

Defining Classification

- Classification occurs everyday in a number of ways in our lives. From sorting your music on your iPod to folding and sorting your clothing.



Figure 1. Cutlery Sorting

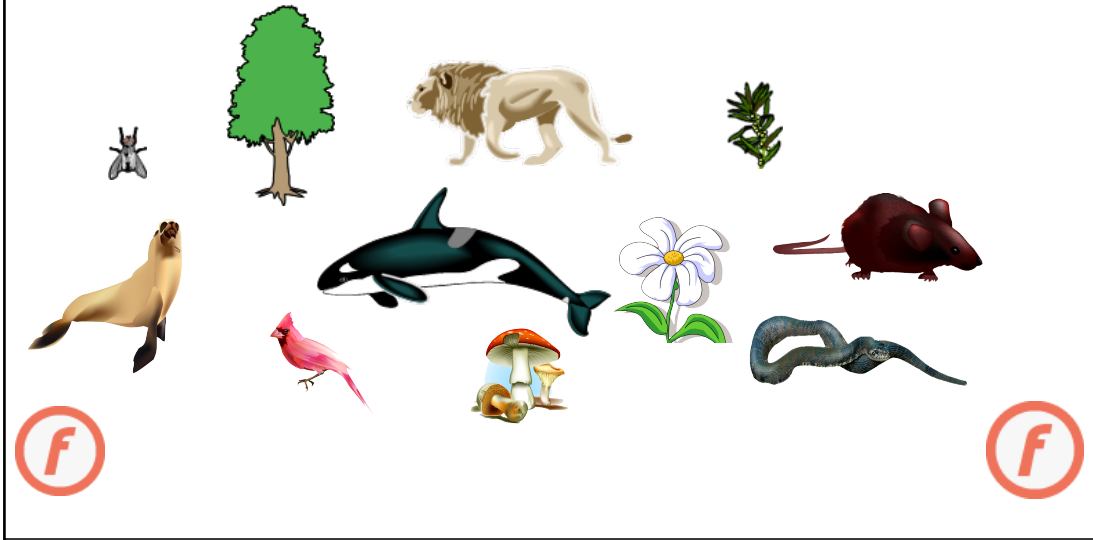
- Can you think of some other ways that classification occurs in your life?



Nov 25-6:12 PM

Classification of living organisms can occur in a number of ways.

How would you classify the organisms below?



Nov 28-8:50 PM

Classification in Biology

- Classification is a branch of Biology known as Taxonomy.
- Taxonomy involves sorting objects based on similarities.
- The system we use today to classify living organisms is based on the system devised by Carolus Linnaeus “The Father of Modern Taxonomy”.



Figure 2: Carolus Linnaeus

[Carolus Linnaeus Video](#)



Nov 25-6:13 PM

Carolus Linnaeus

- Made three major contributions to modern taxonomy:
 - 1) Classification of organisms based on the organisms structure.
 - 2) Established the 7 taxa (groups) currently used in classification.
 - 3) Created Bionomial Nomenclature



Nov 25-6:16 PM

The 7 Taxa

Kingdom
Phylum
Class
Order
Family
Genus
Species

→ Used in
→ Scientific Naming

Can you think of a Mnemonic
Device to remember these taxa?

In my day we used **King Philip**
Came Over From Germany
Swimming.

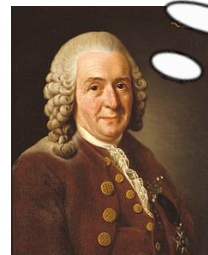


Figure 3: Roslin, A. *Carl von Linne*. 1775



Nov 27-9:21 PM

Classification Using the 7 Taxa

Table 1: *Classification of a Dog and a Wolf using the Seven Taxa*

	Dog	Wolf
Kingdom	Animalia	Animalia
Phylum	Chordata	Chordata
Class	Mammalia	Mammalia
Order	Carnivora	Carnivora
Family	Canidae	Canidae
Genus	Canis	Canis
Species	familiaris	lupus

Did you notice that the only difference between the classification of a dog and a wolf occurs at the species level?



Can you figure out how a human would be classified using the seven taxa?



Nov 27-9:36 PM

Binomial Nomenclature

- Binomial Nomenclature is a two word Latin naming system.
- The first term describes the *genus* and the second term describes the *species*.
- Scientific names are written in *italics* or underlined. The first term is always capitalized while the second is not.

Example: *Homo sapiens* } Humans
Homo sapiens
H. sapiens



Nov 27-9:31 PM

SECTION B: Domains of Life

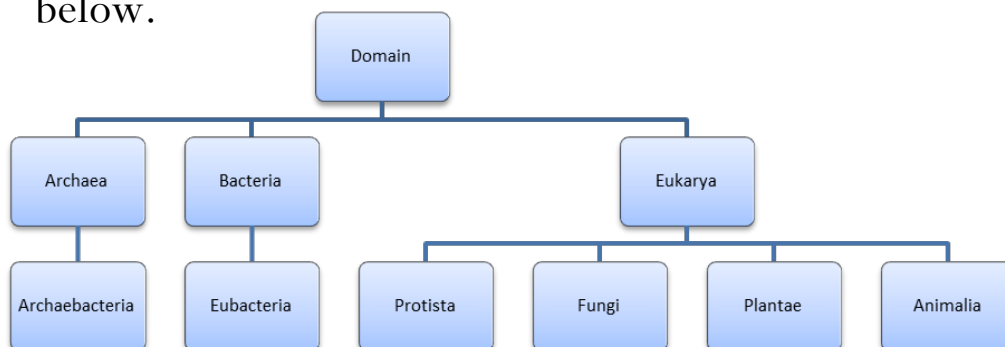
- Modern Taxonomy



Nov 28-8:29 PM

Modern Taxonomy

Classification today begins by subdividing organisms into three domains. These domains are then subdivided into the six kingdoms seen Linnaeus' seven taxa classification system. This system is illustrated below.



Nov 30-11:25 AM

SECTION C: Dichotomous Key

- The Purpose of a Dichotomous Key
- Example
- Application



Nov 28-8:30 PM

The Purpose of a Dichotomous Key

A dichotomous key is a tool used to identify organisms based on sets of paired statements describing physical characteristics of organisms.

Dichotomous keys are not only used by biologist but also by individuals such as bird watchers who simply wish to identify a particular species.

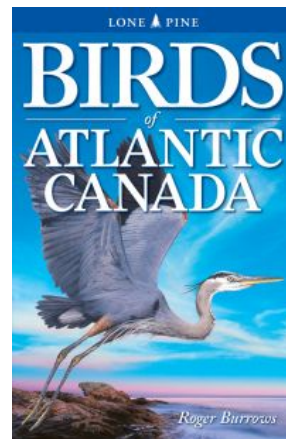


Figure 4: Dichotomous Key for Birds found in Atlantic Canada.



Nov 30-2:12 PM

Dichotomous Key Example

KEY A: KEY to the DOMAINS of LIVING THINGS	
1. Nucleus absent; unicellular	Domain Bacteria or Domain Archaea
Nucleus present; unicellular or multicellular	Domain Eukarya (go to KEY B)



Nov 25-6:17 PM

KEY B: KEY to the KINGDOMS in DOMAIN EUKARYA	
1. Unicellular	Protist Kingdom
Multicellular	
2. Perform photosynthesis	Plant Kingdom (go to KEY C)
Must obtain food	3
3. Absorb food that is externally digested	Fungus Kingdom
Ingest food and digest it internally	Animal Kingdom (go to KEY D)



Nov 25-6:22 PM

KEY C: KEY to DIVISIONS in the PLANT KINGDOM

1. Carpet like plant that has leaf-like blades; lack true roots; require water for sex cell movement. Division Bryophyta

Plants have roots, stems, and leaves. 2

2. Plants grow as clumps of leafy fronds; produce spores; requires water for sex cell union. Division Pterophyta

Plants do not grow as clumps; produce seeds and spores; water is not required for sex cell union. 3

3. Leaves are needlelike; male and female cones produce spores; can grow extremely tall Division Coniferophyta

Leaves are not needle like; have flowers with male and female parts (pollen and eggs); eggs develop into seeds once fertilized Division Anthophyta



Nov 26-8:46 PM

KEY D: KEY to PHyla in the ANIMAL KINGDOM

1. Body has radial symmetry; tentacles with stinging cells surround a single opening (mouth and anus) 2

Body has bilateral symmetry 3

2. Body is soft/jelly-like; tentacles with stinging cells can extend up or down. Phylum Cnidaria

Body is hard with an endoskeleton; body parts occur in multiples of five. Phylum Echinodermata

3. Body is externally segmented 4

Body is not externally segmented 5

4. Body is soft and supported by hydrostatic skeleton; little differentiation between body segments Phylum Annelida

Segmented bodies with an exoskeleton; segment organized into body regions; paired, jointed appendages, may have wings Phylum Arthropoda

5. Small flattened bodies with one opening to gut (mouth and anus) Phylum Platyhelminthes

Body possesses mouth and anus 6

6. Soft body that has a head attached to a large Muscular foot (for movement); many have shells and a rasping tongue. Phylum Mollusca

Body has a notochord; hollow nerve cord along back, some have gills, some have a tail. Phylum Chordata



Nov 26-8:51 PM

Dichotomous Key Application

Use the dichotomous key provided in this lesson to classify an Octopus and an Ostrich Fern into the correct division or phylum. Once you have classified the organisms drag the appropriate classification term underneath the image of the organism.



Nov 26-10:10 PM

Kingdom Protista

Below you will find two key members of Kingdom Protista.

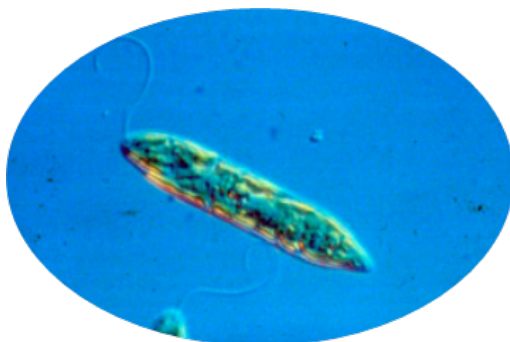


Figure 5: Euglena

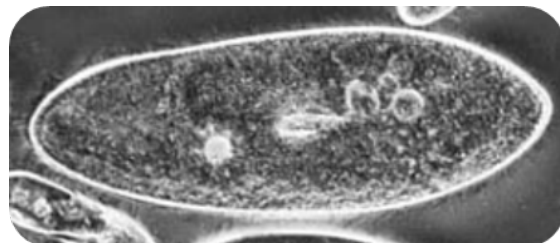


Figure 6: Paramecium

[Return to Dichotomous Key](#)

Nov 26-9:32 PM

Kingdom Fungi

Below you will find two key members of Kingdom Fungi.



Figure 7: Bread Mold



Figure 8: Mushroom

[Return to Dichotomous Key](#)

Dec 9-6:30 PM

Kingdom Plantae

Below you will find members of the various divisions found within Kingdom Plantae.

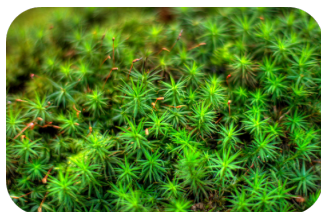


Figure 9: Moss - Division Bryophyta



Figure 10: Fern - Division Pterophyta



Figure 11: Conifer Trees - Division Coniferophyta



Figure 12: Flowers - Division Anthophyta

[Return to Dichotomous Key](#)

Dec 9-6:46 PM

Kingdom Animalia

Below you will find members of the various divisions found within Kingdom Plantae.



Figure 13: Sea Nettle - Phylum Cnidaria



Figure 14: Starfish - Phylum Echinodermata



Figure 15: Tarantula - Phylum Arthropoda



Figure 16: Earthworm - Phylum Annelida



Figure 17: Clam - Phylum Mollusca



Figure 18: Dog - Phylum Chordata

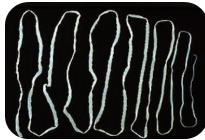


Figure 19: Tapeworm - Phylum Platyhelminthes

[Return to Dichotomous Key](#)

Dec 9-8:07 PM

References

- Birds of Atlantic Canada* [Photograph], Retrieved December 6, 2012 from: <http://www.lonepinepublishing.com/cat/9781551053530/reviews>
- Bread Mold* [Photograph], Retrieved December 7, 2012 from: <http://en.wikipedia.org/wiki/Fungus>
- Clam* [Photograph], Retrieved December 7, 2012 from: <http://en.wikipedia.org/wiki/Clam>
- Conifer Tree* [Photograph], Retrieved December 7, 2012 from: <http://en.wikipedia.org/wiki/Pinophyta>
- Earthworm* [Photograph], Retrieved December 7, 2012 from: <http://en.wikipedia.org/wiki/Annelid>
- Euglena* [Photograph], Retrieved December 7, 2012 from: http://biology.unm.edu/ccouncil/Biology_2013/Summaries/Protists.htm
- Fern* [Photograph], Retrieved December 7, 2012 from: <http://en.wikipedia.org/wiki/Fern>
- Flowers* [Photograph], Retrieved December 7, 2012 from: <http://www.longwood.edu/staff/lehmanne/PhylumAnthophyta/welcomepage.htm>
- Moss* [Photograph], Retrieved December 7, 2012 from: <http://wikileon-period2.wikispaces.com/Bryophytes>
- Mushroom* [Photograph], Retrieved December 7, 2012 from: <http://en.wikipedia.org/wiki/Fungus>
- Natural History Museum. (2008). A film about Carl Linnaeus. Retrieved November 15, 2012 from: http://www.youtube.com/watch?v=Gh_1O-SdLgk
- Paramecium* [Photograph], Retrieved December 7, 2012 from: http://biology.unm.edu/ccouncil/Biology_2013/Summaries/Protists.htm
- Rose, E. (2011). Designing instructional materials. Retrieved September 3, 2012 from: https://lms.unb.ca/d2l/lms/content/viewer/main_frame.d2l?ou=20806&tld=585210
- Roslin, A. (Painter). (1775). *Carl von Linné* [Photograph], Retrieved November 24, 2012 from: http://en.wikipedia.org/wiki/Carl_Linnaeus
- Sea Nettle* [Photograph], Retrieved December 7, 2012 from: <http://en.wikipedia.org/wiki/Cnidaria>
- Sheltie* [Photograph], Retrieved December 7, 2012 from: <http://puppyer.com/dog-breed/sheltie/>
- Starfish* [Photograph], Retrieved December 7, 2012 from: <http://tolweb.org/Echinodermata>
- Tapeworm* [Photograph], Retrieved December 7, 2012 from: http://en.wikipedia.org/wiki/Tapeworm_infection
- Tarantula* [Photograph], Retrieved December 7, 2012 from: <http://www.ucmp.berkeley.edu/arthropoda/arthropoda.html>
- [untitled photograph of carl linnaeus], Retrieved November 22, 2012 from: <http://gap.entclub.org/taxonomists/Linnaeus/index.html>
- [untitled photograph of an octopus], Retrieved November 26, 2012 from: <http://aquariumofvulcan.blogspot.ca/2010/07/octopus.html>
- [untitled photograph of an ostrich fern], Retrieved November 26, 2012 from: <http://www.houwelingerennials.ca/fern%20ostrich%20feather.html>
- [untitled photograph of cutlery], Retrieved December 6, 2012 from: <http://www.containerstore.com/shop/kitchen/drawerOrganizers/trays/productId=10006940>

Nov 26-10:04 PM